

Baker (A. R.)



## THE USE OF THE ELECTRO-MAGNET IN REMOVING FOREIGN BODIES FROM THE EYE.

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While a student in Berlin, in 1882, I first saw Dr. Hirschberg make use of the electro-magnet for the removal of foreign bodies from the eyeball. The magnet he used at that time would only lift about twelve or fifteen ounces.

Immediately upon my return home, in the Fall of 1883, I had constructed this magnet, which I have the pleasure of showing you to-day. It will readily lift five or six pounds, and is but slightly heavier or more cumbersome than Prof. Hirschberg's magnet.

Owing to the inconvenience of transporting a fluid battery, Mr. Shackleton, my student, has constructed this dry-cell battery, which has been in use about four months, and, so far as I can see, is just as strong as ever. The principal objection to dry-cell battery is, that it will finally become exhausted, and the cells will have to be replaced by new ones. But I have no doubt they will last three or four years with the use an oculist requires of them; and as they only cost from fifty to seventy-five cents for each cell, the expense is not as great as that of recharging an ordinary fluid battery. Six cells are used; they are hermetically sealed, and can be upset, or carried upside down, without any fear of damage.

During the past ten years I have probably made use of the magnet in one way and another in a hundred cases, and yet it is doubtful if its use has been of permanent value to patients in more than ten per cent, but it has been of use as a means of diagnosis in a number of cases.

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In a few cases the results of its use have been brilliant, but these occur at such long intervals that the practitioner is often inclined to become discouraged in its use. One of the first patients in which I used it successfully was a child with a small chip of steel in the anterior chamber. The foreign body was removed so quickly and easily that it was with considerable pleasure that I undertook to remove, some months later, a small piece of the head of a nail from the vitreous humor of the eye of a young man, a carpenter, from Meadville, Pa. The piece of iron was very small, not much larger than a pin head, but could be seen with the ophthalmoscope as a bright, beautiful spot, almost in the center of the vitreous. I made an opening in the sclerotic, opposite the foreign body, and upon entering the point of the magnet could hear the peculiar click indicating that it had come in contact with the piece of iron. Upon withdrawing the magnet it failed to follow. Notwithstanding repeated introductions of the magnet, I failed to secure it, and finally enucleated the eye. When I opened the eyeball, and laid it upon the table, and applied the magnet, the iron would be drawn to the magnet, and pull out the vitreous perhaps an inch, like a piece of rubber; in fact, I could lift the entire eyeball off the table with the magnet. In the light of my present experience, I think this eye was needlessly sacrificed, as I do not think that a piece of iron so thoroughly encapsulated could have done much harm if permitted to remain in the eye. I must confess, that this experience somewhat lessened my ardor in the use of the magnet, although I have had several cases since in which it has proved of great service. One case I recall, a Mr. Smith, from Conneaut, referred to me by the late Dr. Weed, who was struck in the eye by a scale which made a clean cut on the inside of the eyeball, which the Doctor supposed to be conjunctival only; he put in a stitch, and when I saw the case afterward, the anterior chamber was filled with blood. Upon bringing the magnet near the eyeball it would follow it, and the patient would



complain of pain. I knew at once that there was a foreign body in the eye; removed the stitch, and upon applying the magnet to the wound, withdrew a scale of steel as large as the nail on my little finger, and about the same shape. The eye made a rapid recovery, retained its natural size and appearance, but no useful vision. Another somewhat similar case was that of a young boy who, with some companions in the country, was playing "Warriors Bold—Knights of Old," with a couple of old axes, which they were slashing together, when a large three-cornered piece penetrated the eye of one of the boys. It was easily removed from the vitreous chamber with the electro-magnet, but it became necessary some time later to remove the eye for fear of sympathetic inflammation of the good eye.

This is the usual course these cases of foreign bodies in the vitreous pursue. There is so much injury done by the penetrating wound, that the eye is necessarily destroyed, even though the foreign body is removed, or, escaping this, a sympathetic inflammation is excited.

Recently, a somewhat more favorable case came under my observation. A young man, working in one of our large manufacturing establishments, was struck in the cornea with a small piece of steel, which was rather deeply embedded in the substance of the cornea. The physician, attempting to remove it, pushed it into the anterior chamber. The case was then referred to me. The piece could be seen distinctly at the lower part of the anterior chamber. Upon placing the magnet at the point of entrance, the piece of steel would jump up to it. Upon removing the magnet, it would drop to its former position. The wound was slightly enlarged, and it was easily removed with the magnet.

The electro-magnet has, in a number of instances, proved of great value to me in making a diagnosis.

In cases in which there is a piece of iron or steel in the eye, when the strong magnet is brought in contact with the

eyeball, and carefully moved in one direction or another, the ball will move with it, and the patient will complain of pain in the eye when the magnet is brought near it. Much care will have to be exercised or the surgeon will be misled by the patient's statements.

Prof. Stilling, I believe, has suggested that an immense magnet connected with a large dynamo might be used, so that when applied to the surface of the eyeball it would draw the steel through the tissues of the eye. If such a strong magnet should prove successful the expense would be too great for any one surgeon, but in a large city, where several oculists were engaged in practice, some hospital ought to be induced to put in such a magnet, and all the oculists, as well as other physicians, would be only too glad to send all their patients to an institution supplied with such an apparatus.

My experience would lead me to conclude that the electro-magnet has a limited field of usefulness in the removal of foreign bodies from the vitreous; that it is of much greater use in removing substances from the anterior chamber, iris and lens, and that it is of considerable value as an aid to diagnosis.